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Overview Of Nutritional Care For Patients with Hepatic Cirrhosis with Ascites, Hypoalbuminemia and Malnutrition in Kudus

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ABSTRACT
Hepatic cirrhosis is a chronic condition characterized by progressive liver damage, widespread fibrosis, and the formation of regenerative nodules that disrupt normal liver structure. Common complications that often occur are ascites, hypoalbuminemia, and protein-energy malnutrition. The aim of the research is to determine the description of nutritional care which includes assessment, diagnosis, intervention, monitoring and evaluation in patients with liver cirrhosis with ascites, anemia and malnutrition at RSUD dr. Loekmono Hadi Kudus. This research is a case report or case study report by observing for 4 days in July 2025. Data collection by means of interviews, observations, measurements and calculations. The data obtained is presented in tables and analyzed descriptively. The nutritional intervention provided is 1755 kcal protein 70.2 grams fat 39 grams carbohydrates 281 grams, decreased sodium and increased protein diet ,texture modified diet, meal schedule 3 x main meals 1 x extra egg white interlude 3 x days, oral route. Theresults of the study showed that monitoring and evaluation of the patient's consumption level increased according to the target (> 80% of requirements), anthropometrically there was no weight loss, there was an improvement in biochemical values (hemoglobin, erythrocytes, hematocrit, leukocytes) but albumin values decreased. Monitoring physical examination evaluation showed symptoms of weakness, ascites, jaundice on the skin, and the abdominal area had improved. Monitoring clinical examination evaluation of blood pressure, pulse, respiratory rate, SPO2, body temperature has improved. At the end of the intervention, nutritional diagnosis NC 4.1.2 malnutrition, chronic disease status is still active, nutritional diagnosis NI 5.3 decreased nutritional requirements (sodium) is resolved.

Keywords: Ascites, Hepatic cirrhosis, Malnutrition, Nutrition care process

INTRODUCTION

Liver cirrhosis is a chronic condition characterized by progressive liver damage, widespread fibrosis, and the formation of regenerative nodules that disrupt normal liver structure. One of the most common complications of cirrhosis is ascites, the accumulation of fluid in the peritoneal cavity caused by increased portal pressure and hypoalbuminemia. Approximately 50% of patients with cirrhosis will develop ascites within 10 years of initial diagnosis (European Association for the Study of the Liver, 2018).

Patients with liver cirrhosis often experience metabolic disorders and decreased food intake that lead to malnutrition, which is closely related to a poor prognosis. In addition, anemia is also often found, especially due to gastrointestinal bleeding, hypersplenism, and nutritional deficiencies such as iron, folate, or vitamin B12 (Kalaitzakis, 2014). The main cause of liver cirrhosis in Indonesia is hepatitis B and C virus infection (HBV around 40–50%, HCV around 30–40%), while alcohol consumption is relatively rare. The 2023 Indonesian Health Survey showed that the prevalence of hepatitis in all ages in Central Java Province was 0.11%, while the prevalence according to characteristics of the 65–74 year age

group was 0.12% and the prevalence of male characteristics was 0.12% and female characteristics was 0.13%. 3 In a study at Dr. M Djamil Padang in the period 2011-2013 found the main cause of liver cirrhosis B at 51%, albumin levels < 3 gr/dl at 71.4%, the most common complication was ascites at 36.3% and the most common classification was Child Pugh C at 60.3% (Lovena, Miro, & Efrida, 2017).

Malnutrition is a common complication in patients with liver cirrhosis, with 80% of patients experiencing malnutrition and ultimately experiencing worsening conditions. Malnutrition increases the risk of morbidity and mortality from cirrhosis (Tsiaousi et al., 2008). Nutritional intervention in diet management is to address nutritional deficiencies in patients with liver cirrhosis, can extend life expectancy, improve quality of life and reduce complications(Persatuan Ahli Gizi Indonesia & Asosiasi Dietisien Indonesia, 2024). The principles of dietary therapy include sodium restriction to control ascites, meeting energy and protein needs to prevent/correct malnutrition, and micronutrient supplementation as needed (European Association for the Study of the Liver, 2018).

Nutritional care in this study uses the Standardized Nutrition Care Process (PAGT), which is a systematic, problem-solving process used by dietetic professionals to think critically and make decisions to address nutrition-related problems and provide safe, effective, and high-quality nutritional care (Supariasa & Handayani, 2019). This scientific study aims to determine the description of nutritional care including Assessment, Diagnosis, Intervention, Monitoring and Evaluation in patients with Hepatic Cirrhosis with Ascites, Hypoalbumin and Malnutrition at Dr. Loekmono Hadi Kudus Regional General Hospital.

METHODS

This study was conducted in July 2025 with observations for 4 days in the Class II Inpatient Ward of Dr. Loekmono Hadi Kudus Regional Hospital. The type of study design is a case report, a type of scientific publication that describes a specific case of a patient or group of patients in clinical practice, in this case a patient with liver cirrhosis with ascites, hypoalbumin, and malnutrition. Data collection was carried out by collecting data on patient characteristics, assessment, diagnosis, intervention, and monitoring of nutritional evaluation.

Nutritional assessments were conducted by collecting data on food history, anthropometry, biochemical data, clinical physical data, and client history. Food history data was collected through a 24-hour food recall prior to hospital admission and analyzed using Nutrisurvey. Food intake was monitored at each meal using the Visual Comstock method or by observing food leftovers on the container. A food recall was also conducted to determine if meals were served outside the hospital. Evaluation was conducted on food intake, with a target of at least 80% of the patient's needs.

Anthropometric data were obtained by measuring the ulna to estimate height (H), and weight (BW) was measured directly. Body Mass Index (BMI) was then calculated and classified according to the 2019 Ministry of Health standards. Mid-upper arm circumference (UMC) was measured to determine nutritional status based on the UMC percentile and classified according to the WHO-NCHS. The target achievement was no weight loss.

Biochemical data is obtained from laboratory results in the e-RM (electronic medical record) and monitored at each examination. Clinical physical data is obtained from the e-RM, observations, and interviews with the patient/family. Client history data is obtained from the e-RM and
Interviews with the patient's family. During the intervention, nutritional education and counseling were provided to the patient and family.

A. Patient Characteristics

Patient name Mr. A, male, 72 years old, elementary school education, unemployed, came with complaints of abdominal enlargement for 2 weeks, weakness, fatigue, decreased appetite. Four years ago he was hospitalized with the same complaints, namely ascites and hepatitis B virus infection. The screening results with the Mini Nutritional Assessment (MNA) obtained a score of 6, meaning the malnutrition category.

B. Nutritional Assessment

Nutritional assessments are conducted by comparing observation results with comparative standards or reference values. The assessment results can be seen in the following table:

Table 1. Nutritional Assessment Results

Domain	Indicator	Assessment Results	Normal Values	Interpretation/ Evaluation
Food/Nutrition Related History (FH)	Energy intake	984 kcal (56%)	1755 kcal	Not enough
	Fat	43.2 grams (110%)	39 grams	Good
	Protein	43.5 gr (62%)	70.2 grams	Not enough
	Carbohydrate	108 gr (38.4%)	281 gr	Not enough
Anthropometric Measurements (AD)	Height (TB)	Height = 164.7 cm		
	Body Weight (BB)	BB ascites 52 kg Dry weight 38 kg		
	Body Mass Index (BMI)	14 kg/m2	18.5-24.9 kg/m2	Thin weight level
	LiLA Percentile	63.5%	85-110%	
Biochemical Data, Medical Tests & Procedures (BD)	Hemoglobin	4.9g/dL	14.0-18.0g/dL	Low
	Erythrocytes	2.62 (million/ul)	4.5-5.9 (million/ul)	Low
	Hematocrit	18.4%	40-52%	Low
	Leukocytes	3.4 (10^3/ul)	4.0-12.0 (10^3/ul)	Low
	urea	47.8 (mg/dl)	19-44 (mg/dl)	Tall
	Creatinine	1.7 (mg/dl)	0.6-1.3 mg/dl	Tall
	Albumin	2.8 g/dl	3.5-5.2 g/dl	Low
	Total Bilirubin	0.89 mg/dl	0.20-1.20	Normal
	Direct bilirubin	0.36 mg/dl	0.0- 0.40	Normal
	Globulin	5.3 g/dl	1.3-3.3 g/dl	Tall
	SGOT	47 U/L	0-50 U/L	Normal
	SGPT	22 U/L	0-50 U/L	Normal
	HBsAg	Positive		Hepatitis B virus infection
	Abdominal ultrasound	Liver cirrhosis with massive		

Domain	Indicator	Assessment Results	Normal Values	Interpretation/ Evaluation
		splenomegaly and ascites		
Focused Physical Findings (PD)	Asthenia	Weak, compos mentis consciousness		
	Loss of subcutaneous fat	Loose skin on the hands and feet		
	Blood pressure	122/72mmHg	120/80 mmHg	Normal
	Pulse	93x/minute	60-100x/minute	Normal
	Respiratory Rate	20 x/minute	12-20x/minute	Normal
	SPO2	97%	95%-100%	Normal
	Body temperature	36.5°C	36.6-37.2°	Normal
	Ascites	Enlarged stomach		
	Jaundice	Jaundice Typical yellow skin color		
Client History (CH)	Current disease diagnosis	Hepatic cirrhosis with ascites since 4 years ago		

Source: Processed data

C. Nutritional Diagnosis

The nutritional diagnosis of this case is concluded as: NC 4.1.2 Chronic disease malnutrition related to the progression of liver disease and decreased ability to consume food as evidenced by insufficient food intake and hypoalbumin. The second nutritional diagnosis is NI 5.3 Decreased nutritional needs (Sodium) related to the presence of ascites as evidenced by the results of ultrasound and an enlarged abdomen.

D. Nutritional Intervention

Nutritional intervention aims to provide sufficient food to improve malnutrition/maintain nutritional status, prevent further liver cell damage, prevent protein catabolism and improve ascites conditions. Diet prescription is energy 1755 kcal protein 70.2 grams fat 39 grams carbohydrates 281 grams, type of diet Low Sodium High Protein, soft food form (rice porridge), meal schedule 3 x main meals 1 x extra egg white snack 3x a day, oral feeding route.

The dietary principle is the requirement according to the recommendation of the European Society of Parenteral and Enteral Nutrition (ESPEN) of 30 kcal/BW/day. Protein is given 1.2 g/kg BW/day to prevent gluconeogenesis and loss of muscle mass. Fat is given sufficiently, namely 20% of total energy needs in an easily digestible form. Carbohydrates are given 64% of total energy needs, providing sufficient carbohydrates can help prevent hypoglycemia due to impaired glycogen synthesis and limited glycogen reserves in the liver.

Sodium restriction of 80 mmol/day or 2 g/day (5 g table salt) aims to help reduce fluid accumulation due to ascites (Plauth et al., 2019). Nutritional intervention is carried out for 4 days with a target food intake of at least 80%.

RESULTS

A. Food Intake

The results of monitoring and evaluation of food intake were carried out for 4 days with the following results:

Table 2. Results of Monitoring and Evaluation of Consumption Levels

		Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrate (g)
1st	Need	1755	70.2	39	281
	Recall Results	614.25	32	20	140
	% Intake	35%	46%	51%	50%
	Achievement	Not achieved	Not achieved	Not achieved	Not achieved
2nd	Need	1755	70.2	39	281
	Recall Results	1198	49.6	25	152
	% Intake	68.3%	70.1%	64%	54%
	Achievement	Not achieved	Not achieved	Not achieved	Not achieved
ıe 3rd	Need	1755	70.2	39	281
	Recall Results	1351	49.7	29	158
	% Intake	77%	71%	74%	56%
	Achievement	Not achieved	Not achieved	Not achieved	Not achieved
4th	Need	1755	70.2	39	281
	Recall Results	1491	61.4	40	224
	% Intake	85%	87.5%	102%	79.7%
	Achievement	achieved	achieved	achieved	achieved

Source: Primary Data, July 2025

Table 3. Development of Diet Therapy

Indicator	Day 1	Day 2	Day 3	Day 4
Types of Diet	Low Sodium High Protein	Low Sodium High Protein	Low Sodium High Protein	Low Sodium High Protein
Food Forms	Soft (rice porridge)	Soft (rice porridge)	Soft (rice porridge)	Soft (rice porridge)
Frequency	3 x main meals extra 3 egg whites 1 x snack	3 x main meals extra 3 egg whites 1 x snack	3 x main meals extra 3 egg whites 1 x snack	3 x main meals extra 3 egg whites 1 x snack
Meal Route	Oral	Oral	Oral	Oral

Indicator	Day 1	Day 2	Day 3	Day 4

Source: Processed data

B. Biochemistry

The results of monitoring and evaluation of biochemical data can be seen in the following table:

Table 4. Monitoring and Evaluation of Biochemical Data

Indicator	Initial Intervention	End of Intervention	Normal Values	Interpretation
Hemoglobin	4.9g/dL	10.5 g/dl	14.0-18.0g/dL	Undergoing improvement
Erythrocytes	2.62 (million/ul)	4.68 (million/ul)	4.5-5.9 (million/ul)	Undergoing improvement
Hematocrit	18.4%	35.4%	40-52%	Undergoing improvement
Leukocytes	3.4 (10^3/ul)	3.5 (10^3/ul)	4.0-12.0 (10^3/ul)	Undergoing improvement
Albumin	2.8 g/dl	2.4 g/dl	3.5-5.2 g/dl	Decline

Source: e-RM Secondary Data, July 2025

C. Clinical Physical Examination

The results of the clinic's physical monitoring and evaluation can be seen in the following table:

Table 5. Physical Data Evaluation Monitoring

Data	Day 1	Day 2	Day 3	Day 4	Interpretation
Weak	√	√	-	-	Undergoing improvement
Ascites	+ + +	++	+	-	Undergoing improvement
The fluid that comes out		1000 ml	2000 ml	-	
Waist circumference	88 cm	-	-	75 cm	
Jaundice	√	√	√	√	Permanent appearance
Jaundice on the skin	√	√	-	-	Undergoing improvement
Flat stomach	√	√	-	-	Undergoing improvement

Source: e-RM Secondary Data and Primary Data, July 2025

Table 6. Clinical Data Evaluation Monitoring

Data	Normal Values	Day 1	Day 2	Day 3	Day 4	Interpretation
Blood pressure	120/80 mmHg	128/74 mmHg	114/72	114/75	110/80 mmHg	Normal
Pulse	60-100 x/minute	129 x/minute	82 x/minute	99 x/minute	80 x/minute	Normal
RR	20x/minute	20 x/minute	20 x/minute	20 x/minute	20 x/minute	Normal
Temperature	36.6-37.2°C	37.6 °C	36.2 °C	36.2°C	36.5 °C	Normal
SpO2	95%-100%	98%	99%	99%	99%	Normal

Source: e-RM Secondary Data, July 2025

Based on the results of clinical data in the table, it shows normal values for blood pressure, pulse, respiratory rate and SpO2 data, while body temperature data decreased on the 2nd and 3rd days, but at the end of the intervention it was close to normal.

On the third day of the nutritional intervention, nutrition education was provided to the patient and family. The education provided covered the principles, goals, and requirements of a low-sodium, high-protein diet. A leaflet was provided to the family as a guide to meal planning at home. The patient and family agreed to follow the recommended diet.

D. Nutritional Diagnosis Status

The results of the development of nutritional diagnosis status are as follows:

Table 7. Development of Nutritional Diagnosis Status

Nutritional Diagnosis	Day 1	Day 2	Day 3	Day 4
NC 4.1.2 Chronic disease malnutrition	active	active	active	active
NI 5.3 Decreased nutritional requirements (Sodium)	active	active	active	completed

Source: Processed Data

DISCUSSION

A. Food Intake

The results of monitoring and evaluating food intake from days 1 to 3 were not achieved due to persistent ascites, which caused a feeling of fullness, but food intake had increased. By day 4, the feeling of fullness had resolved and deflated, leading to a resolution of the eating disorder and a achieved consumption level.

Insufficient food intake is a factor that significantly influences the clinical condition of patients with liver cirrhosis, particularly in the development and worsening of ascites. Patients with cirrhosis often experience anorexia, nausea, changes in taste, and bloating, leading to decreased food consumption. Consequently, energy and protein deficiencies occur, which exacerbate hypoalbuminemia, a key condition in the pathophysiology of ascites (Kalaitzakis, 2014). This is in line with research at Dr. Saiful Anwar General Hospital in

Malang, where patients with liver cirrhosis had an average consumption of energy, protein, fat, and carbohydrates in the insufficient category, and also experienced weakness, tea-colored urine, decreased appetite, and abdominal pain (Yusminingrum, Widajati, & Kholidah, 2019).

The patient was placed on a low-sodium, high-protein diet due to the physiological conditions of liver cirrhosis, which includes ascites, hypoalbuminemia, and malnutrition. The diet consisted of soft foods for four days, according to the patient's tolerance. Meal frequency was three main meals, three extra egg whites, and one snack.

Restricting sodium to 80–120 mmol/day, or the equivalent of 4.6–6.9 g of table salt, helps reduce fluid accumulation in the peritoneal cavity. A low-sodium diet helps make medical therapy more effective.1 Pharmacological therapy Mr. A. received spironolactone and furosemide, both of which function as diuretics in the treatment of ascites.

A high-protein diet is recommended to prevent muscle loss and correct hypoalbuminemia. Adding egg whites can help increase subnormal albumin levels. A study by Rohmawati et al. (2018) showed that administering two egg whites daily for 7 days to patients with low albumin levels significantly increased serum albumin levels (Rohmawati, Asih, & Setiani, 2018).

From the interview results it was found that for approximately 1 month before being admitted to the hospital, Mr. A. consumed porridge while protein sources were often not consumed and for 2 weeks Mr. A's food intake decreased. Lack of nutrients, especially animal protein, based on several research results shows a risk of developing liver cirrhosis. Animal proteins that play an important role are choline and methionine, both of which play a role in removing excess fat, cholesterol, and toxins in the liver. In addition to animal protein, a lack of vitamin B complex, tocopherol also risks causing liver cirrhosis (Supariasa & Handayani, 2019).

B. Anthropometry

Initial measurements of the patient's intervention showed severe ascites, namely ascites was visible from clear abdominal distension, so the measurement results were reduced by 14 kg to obtain an estimated dry weight of 38 kg (European Association for the Study of the Liver, 2018). At the end of the intervention, the patient was no longer experiencing ascites, and a direct weight measurement was performed, with a result of 39.5 kg. This difference cannot be used as a guideline because the initial measurement was an estimate.

Assessment of the patient's nutritional status using the percentage of LiLA and BMI indicates a category of severe wasting. This is in line with research by Ndraha et al. (2009) who explained that at Koja Hospital in Jakarta, 65-90% of patients with liver cirrhosis experienced malnutrition, especially those with Child-Pugh C classification and a higher incidence occurred in male patients (Sulaiman, 2012). The nutritional status of severe wasting in Mr. A was caused by insufficient food intake over a long period of time. Lack of energy and protein intake causes the body to start breaking down fat and muscle reserves to meet energy needs, so that food intake that is less than the needs over a long period of time causes malnutrition.

C. Biochemistry

Biochemical data monitoring and evaluation results showed improvements in Hb, erythrocyte, hematocrit, and leukocyte counts, while albumin levels decreased. The anemia profile, consisting of hemoglobin, erythrocyte, hematocrit, and leukocyte counts, was below normal at the beginning of the intervention, but improved after the end of the intervention. This improvement was supported by the transfusion of three bags of cross-PRC blood during

the intervention.

Anemia is a common condition that often occurs in patients with liver cirrhosis. Anemia is defined as a decrease in hemoglobin levels below normal values, which vary depending on age and gender. There are several causes that result in an anemic profile appearing in patients with liver cirrhosis. The anemia in Mr. A is likely due to splenomegaly, an enlarged spleen due to congestion of the red pulp of the spleen due to portal hypertension. The anemia encountered is normocytic, normochromic, and mild, sometimes macrocytic, caused by folic acid and vitamin B12 deficiencies or splenomegaly (Hadi, 2013).

The examination also revealed positive hepatitis B, which the interview revealed had been present for four years. Hepatitis B virus tends to be more persistent and exhibit a chronic course. If laboratory tests show positive HBsAg and persistent e-antigen for more than 10 weeks, and fasting bile acids remain elevated for more than six months, this chronic hepatitis condition carries a greater risk of developing cirrhosis (Supariasa & Handayani, 2019).

The albumin test results at the end of the intervention decreased to 2.4 g/dl, while Mr. A was not given albumin therapy during medical therapy. Hypoalbuminemia occurs when a person does not have enough albumin protein in their bloodstream. Albumin is a protein produced in the liver and has a very important function for the body. In addition, albumin is also known to function in the formation of most blood plasma. Hepatic cirrhosis causes hepatocyte cell damage and liver tissue fibrosis, so that the liver's ability to synthesize albumin is significantly reduced (Jalan & Hayes, 2003). In addition, malnutrition caused by decreased appetite results in long-term protein energy intake causing decreased protein depletion resulting in hypoalbuminemia.

D. Clinical Physical Examination

Based on the physical data results in the table, it shows that Mr. A experienced improvements in physical data with weakness, ascites, jaundice on the skin, abdominal bloating while icteric eyes were still present at the end of the intervention. On the 2nd day of the intervention, Mr. A. was fitted with a cystofix to remove fluid from the stomach so that the total volume produced during the intervention was 3000 ml. This excreted fluid caused the abdominal bloating to decrease and the abdominal circumference to decrease by 13 cm to normal.

Jaundice is an abnormal accumulation of bilirubin pigment in the blood, causing dark urine, pale stools, and yellowish skin discoloration. Jaundice is most easily seen in the sclera of the eye because elastin in the sclera binds bilirubin and usually occurs when bilirubin levels reach 2.5 mg% or more. In liver cirrhosis, jaundice often appears as a complication of progressive liver dysfunction, especially in the decompensated phase. In cirrhosis, liver tissue damage due to fibrosis and necrosis reduces the number and function of remaining active hepatocytes. This results in decreased conjugation of unconjugated bilirubin to conjugated bilirubin, resulting in accumulation of unconjugated bilirubin in the blood (Supariasa & Handayani, 2019), (Sulaiman, 2012).

E. Nutritional Diagnosis Status

The development of the nutritional diagnosis status NC 4.1.2 chronic disease malnutrition is still active because addressing this nutritional problem requires a long time but there has been an improvement in food intake, it is hoped that during the stay at home the food intake will improve so that there will be an improvement in nutritional status. The development of the nutritional diagnosis status NI 5.3 The decrease in nutritional needs (Sodium) at the end of the intervention has been resolved because there has been an improvement in ascites.

CONCLUSION

The results of the study showed that monitoring and evaluation of patient consumption levels increased according to the target (> 80% of needs), anthropometry showed no weight loss, there was an improvement in biochemical values (hemoglobin, erythrocytes, hematocrit, leukocytes) but albumin values decreased. Monitoring and evaluation of physical examinations showed symptoms of weakness, ascites, jaundice on the skin, and abdominal distention improved. Monitoring and evaluation of clinical examinations on blood pressure, pulse, respiratory rate, SPO2, and body temperature improved. At the end of the intervention, the nutritional diagnosis of NC 4.1.2 chronic disease malnutrition was still active, and the nutritional diagnosis of NI 5.3 decreased nutritional needs (Sodium) was resolved.

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